

# Iowa Department of Public Health, Oral Health Bureau

## Fluoride Varnish Protocol

### ***Background***

Fluoride varnishes have been used in Europe for more than 30 years, and have recently been approved for use in the United States. They received approval in the United States as cavity varnishes and desensitizing agents, however one of the most promising uses for fluoride varnishes is in the prevention of tooth decay. The use of fluoride varnish by dentists for this purpose is referred to as "off-label" use.

### ***Fluoride Content and Uptake into Enamel***

There are 3-4 fluoride varnishes available for use in the United States. Duraflor and Duraphat are two that are commonly used. All contain 5% NaF. The varnishes contain 2.26% by weight fluoride ion in a colophony base. This forms a sticky layer on the tooth following application, which hardens on contact with saliva. Fluoride is then absorbed into the enamel of the tooth. It is recommended that the varnish be allowed to remain on the teeth for up to four hours for optimal absorption. A study by Koch and Petersson measured the levels of fluoride in extracted teeth following application of Duraflor, and found concentrations between 2,250 and 3,800 ppm in the enamel. It was also determined that increasing the time the varnish remained on the teeth from one to six hours more than doubled the fluoride level in the enamel.

### ***Caries Prevention***

Most studies have shown 25-45% reductions in the decay rate with the use of fluoride varnish. Of special note is the reduction of decay in pits and fissures, as well as on smooth surfaces of teeth. A two-year study by Holm using 225 3-year-olds resulted in a 44% caries reduction rate following semi-annual varnish applications.

### ***Safety***

The concentration of fluoride in varnishes is much higher than that of APF gels or other topical fluorides, however, due to the sticky form of the varnish and the small amount used per application, risk of ingestion and toxicity is very low. Less than 0.5 ml of varnish is usually required to coat the teeth of a young child.

### ***Application of Fluoride Varnish***

1. Criteria for the use of fluoride varnish include the presence of factors that put a child at risk for caries, including visible plaque on the primary incisors, carious lesions, white-spot lesions, or a history of decay. Socio-economic status (especially income) can also be an indicator of risk, as low-income children tend to experience more caries than other children.
2. Clean the teeth. The teeth need to be "toothbrush clean" before fluoride varnish is applied. Application after a dental prophylaxis is also acceptable.
3. Have the varnish ready. Use one small drop of varnish (.3 ml) per child, dispensing it on the tray cover or in a small cup.
4. Isolate and dry the quadrant to be treated. This can be accomplished with gauze or air. Drying should be thorough, but not excessive.
5. Apply the varnish with any convenient applicator to all exposed surfaces of the teeth, including the chewing and interproximal surfaces. Disposable brushes are very effective, or cotton-tipped applicators can be used.
6. Repeat for all remaining quadrants.

7. Ask the patient not to brush their teeth for four hours following the application. Parents should be informed that the child's teeth will look yellow until the varnish is brushed off. Manufacturers of fluoride varnish recommend the patient wait 30 minutes after application before eating or drinking.
8. Fluoride varnish should be applied at least twice a year. Applications 3 times a year or 3 times during a 1-week period are also effective.

***Personnel Required for Fluoride Varnish Application***

Fluoride varnish may only be applied by a licensed dentist, licensed dental hygienist, licensed physician or other health professional functioning within their scope of practice or licensure as provided under Iowa Medicaid rules.

Any amendment to the Title V budget must be approved by the Family Health Bureau prior to implementation.